L 10154-63
ACCESSION NR: AP3000322

energy donor was naphthalene. The spectra were excited by filtered radiation from a PRK-2 mercury discharge tube and recorded photographically on an ISP-51 spectrograph. A vibrational analysis of the spectrum at 77°K is presented in a table; the shortest wavelength luminescence line was associated with the 0-0 transition. Next maintaining a constant concentration of DAE in the hexane solution there were prepared samples with 0.1, 1 and 10 moles naphthalene per mole of DAE. In the first the luminescence of only DAE was directly excited; in the second the naphthalene was also excited. In the 10 to 1 solution under excitation by the 313 millimicron line the DAE was excited primarily as a result of ennergy migration. It is inferred that in frozen solutions there are present two types of luminescence centers; these are formed by the same molecules but with different kinds of short-range order. Energy migration should be taken into account in using the Shpol'skiy technique. Orig. art. has 1 figure and 1 table.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 12Jun63 ENCL: 00

SUB CODE: PH NR REF SOV: 003 OTHER: 000

Card 2/2

ACCESSION NR: AP4043384 S/0181/64/006/008/2522/2524

AUTHORS: Naboykin, Yu. V.; Avdeyenko, A. A.

TITLE: Effect of "detection" and photoconductivity activation energy in pyrene single crystals

SOURCE: Fizika tverdogo tela, v. 6, no. 8, 1964, 2522-2524

TOPIC TAGS: organic material, photoconductivity, activation energy, single crystal, hole conduction, electron conduction

ABSTRACT: The scheme proposed by A. N. Terenin (Zhurn. VKhO, v. 5, 498, 1960) to explain the photoelectric properties of organic photoconductors with monopolar photoconductivity, is extended by the authors to photoconductivity with carriers of both polarities. It is concluded from the published experimental data that the first singlet excited level is not a conduction level, for practically no photocurrent is observed upon excitation in the intrinsic region at

ACCESSION NR: AP4043384

low temperatures, although the mobilities of the holes and of the electrons increases. It is likewise concluded that the hole conduction level cannot be related with the ground state of the molecules, for the same considerations. It is suggested that excitation of holes in the electrons at the corresponding conduction levels must incorporate as an intermediate state hole and electron traps. The thermal depletion of these traps causes the temperature dependence of the photocurrent. Measurements of the activation energy of photoconductivity in single crystals of zone-purified pyrene illuminated on the negative and positive electrode sides indicate that the activation energy of the hole photocurrent exceeds the activation energy of the electron photocurrent. This means that the ratio of the currents produced by illuminating the positive and negative electrodes (the so-called detection effect) is determined in organic crystals not by the mobility ratio alone, as previously assumed, but principally by the ratio of the activation energies. The results confirm that the carrier production is essen-

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ACCESSION NR: AP4043384

tially a bimolecular process, as recently demonstrated by M. Kleinerman et al. (J. Chem. Phys. v. 37, 1825, 1962). They also demonstrate that a direct optical transition into the conducting state is forbidden. Orig. art. has: 2 figures and 1 formula.

ASSOCIATION: Fiziko-tekhnicheskiy institut nizkikh temperatur, AN UkrSSR, Khar'kov (Physicotechnical Institute of Low Temperatures, AN UkrSSR)

SUBMITTED: 24Feb64 ENCL: 00

SUB CODE: SS, OP NR REF SOV: 003 OTHER: 011

Card 3/3

L 11839-65 EWT(l)/EWG(k)/EWT(m)/EWP(j)/EEC(t) Pc-4/Pz-6 IJP(c) AFMD(t)
AT/RM
ACCESSION NR: AP4048434 S/0181/64/006/011/3474/3475

AUTHORS: Avdeyenko, A. A.; Naboykin, Yu. V.; Sheina, S. P. 15

TITLE: Effect of external field on the spectrum of the inhomogeneous photoconductivity in pyrene single crystals

SOURCE: Fizika tverdogo tela, v. 6, no. 11, 1964, 3474-3475

TOPIC TAGS: photoconductivity measurement, carrier recombination, carrier lifetime

ABSTRACT: To trace the influence of an external field on the spectral curve of the photocurrent of a layer-type photocell (in which the illumination passes through a transparent electrode along the applied field), the authors used single-crystal pyrene purified by sublimation, a DMR-4 double monochromator, a DKSSh-200 electronically stabilized xenon lamp, and a U1-2 electrometric amplifier. The results indicate that at low fields there is only weak separation of

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L 14839-65
ACCESSION NR: AP4048434

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the charges and their recombination rate is high if their density in the generation region is high. The anticorrelation between the photoconductivity and absorption spectra in weak fields is attributed to the decrease in the carrier lifetime in the region of strong absorption. Favoring this conclusion is also the behavior of the spectral curve when the illumination is applied from the side of the negative electrode, where the field has a smaller effect, because the drift mobility of the electrons in pyrene is much smaller than the drift mobility of the holes. "The authors thank V. V. Yeremenko for a discussion." Orig. art. has: 1 figure.

ASSOCIATION: Fiziko-tekhnicheskiy institut nizkikh temperature AN UkrSSR, Khar'kov (Physicotechnical Institute of Low Temperatures, AN UkrSSR)

SUBMITTED: 09Jun64 ENCL: 00
SUB CODE: SS, OP NR REF SOV: 003 OTHER: 008

ACCESSION NR: AP4020977 S/0051/64/016/003/0545/0547

AUTHOR: Naboykin, Yu. V.; Ogurtsova, L. A.; Pechiy, K. T.

TITLE: Peculiarities of the luminescence spectra of organic molecules under intense stimulation

SOURCE: Optika i spektroskopiya, v. 16, no. 3, 1964, 545-547

TOPIC TAGS: luminescence, luminescence reabsorption, pulse excitation, flash excitation, coronene, benzophenone, Michler ketone, methacrylate, triplet-triplet transitions, organic molecule luminescence

ABSTRACT: The present investigation was undertaken in view of the current interest in the spectral characteristics of substances in the range of high stimulating light intensities when the population of the higher levels of the optical centers becomes high. Under such conditions, which are obtainable through use of intense flashtube illumination, triplet-triplet transitions may occur. However, there is only one paper in the literature reporting observation of triplet-triplet emission (H. von Schuler and G. Arnold, Zs. Naturforsch., 16a,1091,1961), and this pertains to naphthalene vapor. Accordingly, the present work makes an investigation into a luminescence reabsorption associated with triplet transitions (triplet-triplet

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ACCESSION NR: AP4020977

absorption) in benzophenone, coronene, Michler ketone, and some other organic molecules dissolved in polymethacrylate and cooled to -120°C in a special cryostat. The luminescence spectra were excited by the light flashes from a powerful IFK-2000 (infrared) flash tube with a UFS-2 (UV) filter and photographed by means of an ISP-51 spectrograph with 1) frontal excitation (to eliminate reabsorption) and 2) side excitation (condition favorable for reabsorption). The absorption spectra were recorded by means of an ISP-28 spectrograph with a simplified pulse photometer. The traces of the different spectra of the above-mentioned three compounds in methacrylate are reproduced. In each case there is some evidence of reabsorption. The experimental data indicate that under certain conditions triplet-triplet absorption in organic molecule systems may result in significant alteration of the luminescence spectra due to reabsorption, a fact that should be borne in mind in investigating luminescence spectra of organic systems. Orig. art. has: 4 figures.

ASSOCIATION: none

SUBMITTED: 18Jul63 DATE ACQ: 02Apr64 ENCL: 00

SUB CODE: PH NR REF SOV: 001 OTHER: 002

Card 2/2

ACCESSION NR: AP4032879 S/0051/64/016/004/0712/0713

AUTHOR: Avdeyenko,A.A.; Akopov,V.M.; Kramarenko,N.L.; Naboykin,Yu.V.; Shklyarevskiy, I.N.

TITLE: Concerning measurement of high reflection coefficients

SOURCE: Optika i spektroskopiya, v.16, no.4, 1964, 712-713

TOPIC TAGS: reflection coefficient, reflection coefficient measurement, mirror, silver mirror

ABSTRACT: In connection with designing interference instruments (for example, Fabry-Perot etalons) and lasers it is essential to know the reflection coefficient of the mirror components, and the higher the coefficient the more important is accuracy of the measurement result. In the present paper there is proposed a procedure and setup, based on multiple reflection, designed for accurate measurement of the reflection coefficients of mirrors with a high coefficient. The requisite evaluation formulas for two-fold and eight-fold reflection (the latter was employed by the authors) are adduced. A diagram of the setup is shown; it consists essentially of a collimated source, a beam splitting plate, and an appropriate photocell with a

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L 45445-65 EWT(1)/EWT(m)/EPF(c)/EWP(j)/T/EEC(b)-2 Pc-4/Pr-4/P1-4 IJP(c)
ACCESSION NR: AP5007061 S/0120/65/000/001/0206/0207 GG/RM

AUTHOR: Dobrokhotova, V. K.; Naboykin, Yu. V.

TITLE: Scintillator based on single crystals of diphenylene oxide

SOURCE: Pribory i tekhnika eksperimenta, no. 1, 1965, 206-207

TOPIC TAGS: scintillator, diphenylene oxide

ABSTRACT: The results of an investigation of single crystals of diphenylene oxide with an admixture of $\beta\beta$-dinaphthylethylene are briefly reported. Although the light yield of these crystals is only 75% of that of naphthalene-base crystals, the new crystals have this advantage: diphenylene oxide does not sublimate or oxidize in the air. Its maximum radiation lies near 4100 Å. "In conclusion, the authors wish to thank Yu. A. Tsirlin for measuring the light yield of scintillations." Orig. art. has: 1 figure and 1 table.

ASSOCIATION: Fiziko-tekhnicheskiy institut nizkikh temperatur AN UkrSSR (Physico-Technical Institute of Low Temperatures, AN UkrSSR)

SUBMITTED: 02Dec63 ENCL: 00 SUB CODE: OP, SS

NO REF SOV: 003 OTHER: 000

Card 1/1

L 47071-65 EWG(j)/EWP(e)/EWT(m)/EPF(c)/EWP(i)/EPR/EWP(t)/EWP(b) Pr-4/
Ps-4 IJP(c) JD/WR

ACCESSION NR: AP5011895 UR/0120/65/000/002/0189/190 31 30 B

AUTHOR: Naboykin, Yu. V.; Kramarenko, N. L. 27 27

TITLE: Interference mirrors with interleaving layers of lead monoxide and cryolite

SOURCE: Pribory i tekhnika eksperimenta, no. 2, 1965, 189-190

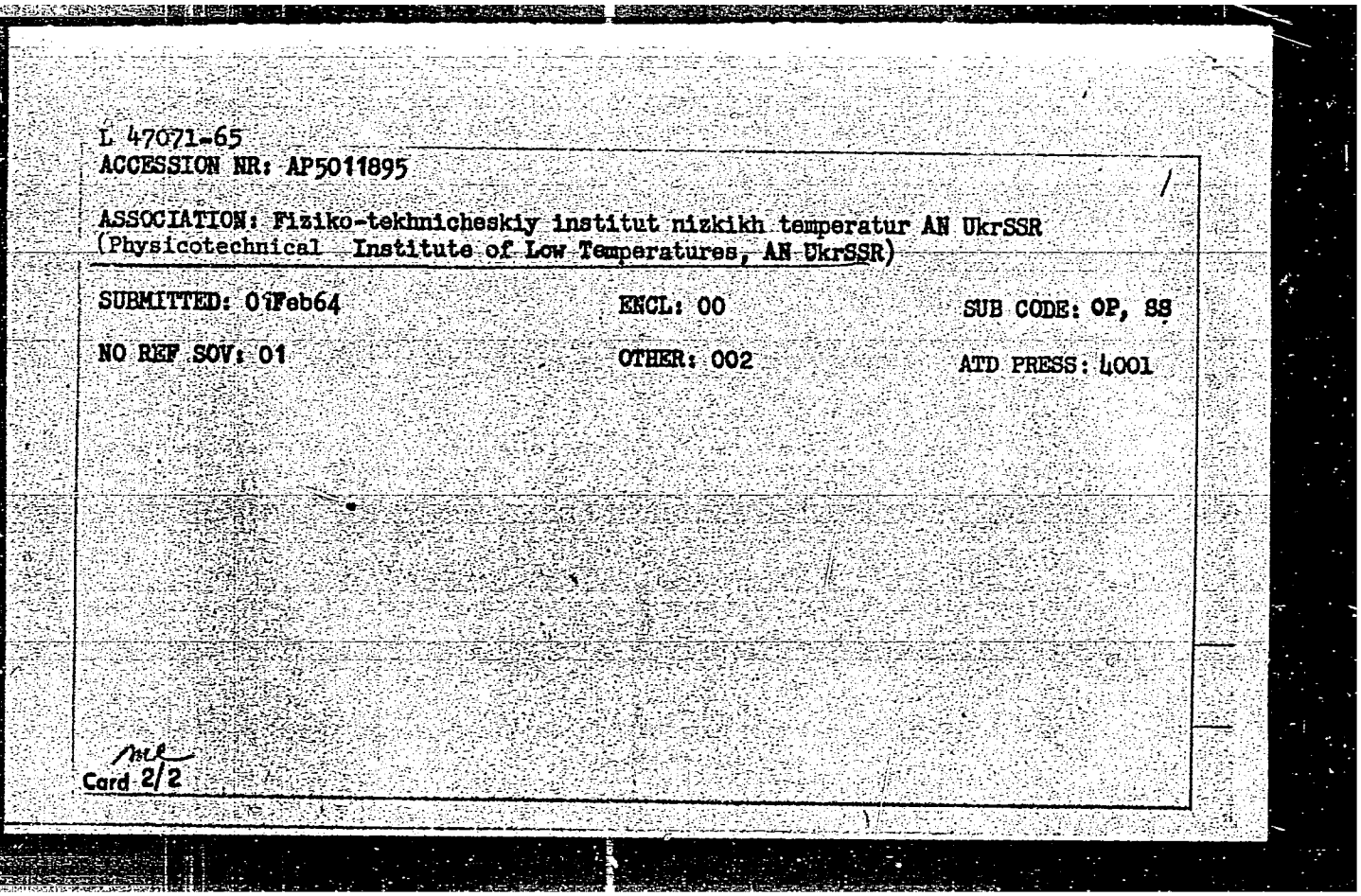
TOPIC TAGS: interference mirror, color selective mirror, dichroic mirror, lead monoxide, cryolite, zinc sulfide, multilayer mirror, mirror coating

ABSTRACT: Preparation of color-selective mirrors with ZnS has been difficult because of the high vaporization temperature of this substance and the necessity of maintaining a high (10^{-7} torr) vacuum during the vaporization process. An attempt is reported to substitute PbO (with cryolite) for ZnS in the preparation of multilayer mirror coatings. These results are reported:

With λ = 600 mμ:	5 layers:PbO and cryolite	7 layers:ZnS and cryolite
Reflection %	72.9	79.8
Transmission %	16.3	14.7
Absorption %	4.5	5.4

Orig. art. has: 2 figures and 1 table. [03]

Card 1/2



L 47071-65
ACCESSION NR: AP5011895

ASSOCIATION: Fiziko-tekhnicheskiy institut nizkikh temperatur AN UkrSSR (Physicotechnical Institute of Low Temperatures, AN UkrSSR)

SUBMITTED: 01Feb64 ENCL: 00 SUB CODE: OP, SS

NO REF SOV: 01 OTHER: 002 ATD PRESS: 4001

Card 2/2

L 01280-66 EWT(m)/EPF(c)/EWP(j) RM

ACCESSION NR: AP5020791 UR/0048/65/029/008/1317/1320

AUTHOR: Naboykin, Yu. V.; Sidorov, S. V.

TITLE: Polarization of the luminescence of naphthalene in the benzophenone lattice /Report, 13th Conference on Luminescence held in Khar'kov 25 June to 1 July 1964/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 29, no. 8, 1965, 1317-1320

TOPIC TAGS: polarized luminescence, luminescent crystal, organic crystal, crystal orientation, laser optic material

ABSTRACT: The polarization of the luminescence of naphthalene molecules in benzophenone crystals was investigated in order to determine the orientation of the foreign molecule in the crystal lattice. The investigation was undertaken in part because of the possible technical importance of the material for use in lasers. The crystals were grown by the method of A.A.Chumakov (Sb. Rost kristallov, vol.2, p. 109. Izd. AN SSSR, M., 1959) from solutions of 30 g benzophenone and 3 g naphthalene in 375 cc of isooctane. Samples cut parallel to a number of different crystallographic planes were investigated. The sample was illuminated obliquely, and the fluorescence leaving the sample at right angles to the surface was examined

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L 01280-66

ACCESSION NR: AP5020791

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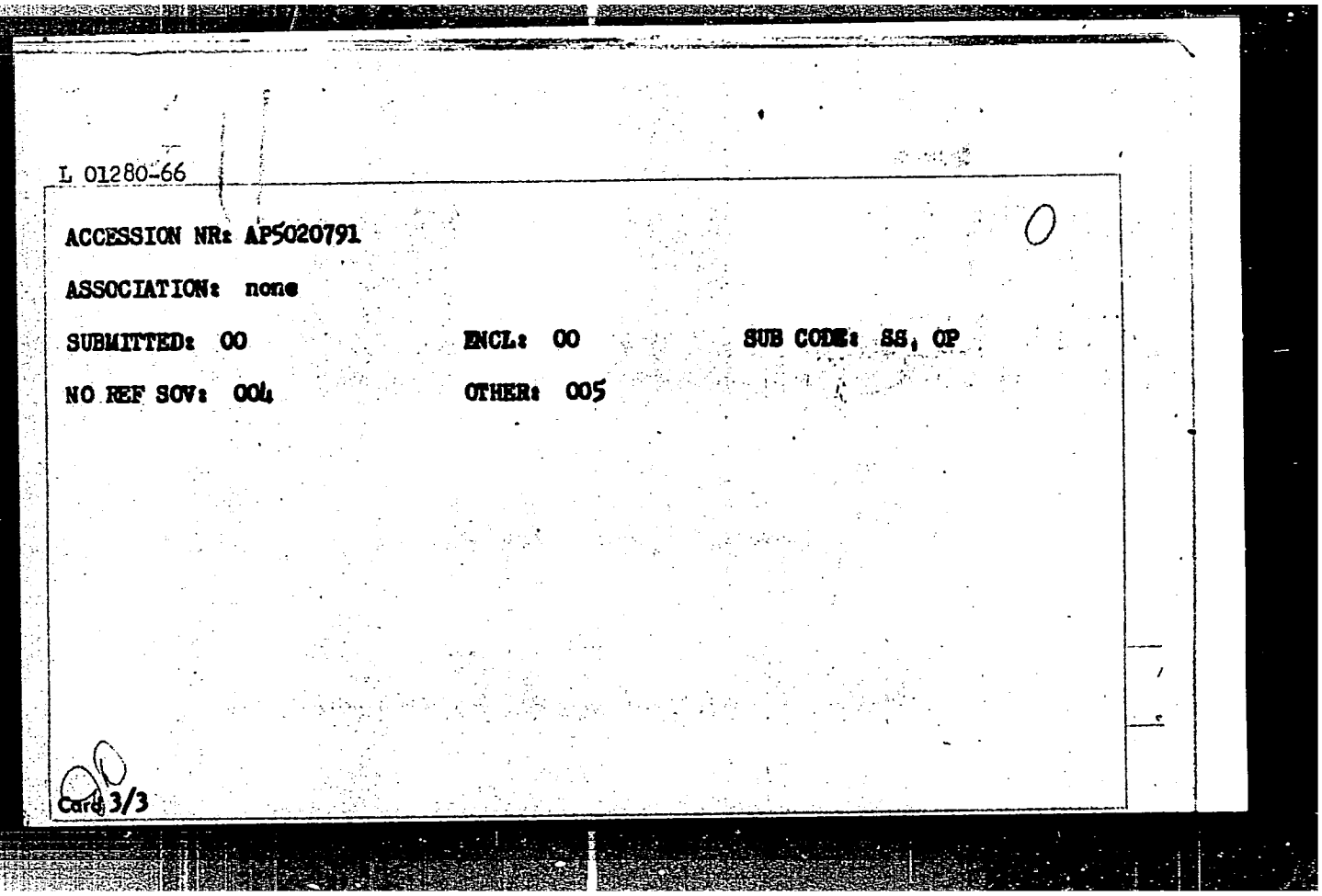
with a polaroid analyzer, a monochrometer and a photomultiplier. The sample could be cooled to 80°K. Correction was made for the polarization introduced by the apparatus; this was determined by examining a piece of ground glass located at the sample position and illuminated from behind. Polarization introduced by double refraction in the sample was negligible. From an analysis of the polarization of the naphthaline luminescence in differently oriented crystals it was found that the triplet-singlet oscillator in the naphthalene molecule in the crystal is parallel to the intersection of two planes of which one is perpendicular to the (110) plane and makes an angle of 20° with the [001] direction and the other is perpendicular to the (001) plane and makes a minimum angle of 52° with the [010] direction. The oscillator is nearly perpendicular to the (001) plane. There are (undisclosed) indications that, contrary to the opinion of R.Williams (J. Chem. Phys., 30, 233, 1959), the oscillator for the triplet-singlet transition in naphthalene is perpendicular to the plane of the molecule. "In conclusion, the authors express their gratitude to L.N.Ovchinnikova for assistance with the work." Orig. art. has: 3 figures.

44,55

Card 2/3



L 01280-66

ACCESSION NR: AP5020791

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: SS, OP

NO REF SOV: 001 OTHER: 005

Card 3/3

L 15568-66 EWT(l)/EWT(m)/ETC(f)/EWG(m)/EWP(j)/T/ETC(m)-6 DS/WW/RM
ACC NR: AP6004404 SOURCE CODE: UR/0051/66/020/001/0053/0057

AUTHOR: Naboykin, Yu. V.; Ogurtsova, L. A.; Fil', I. D. 69

ORG: none 8

TITLE: Emission spectra and luminescence kinetics of organic molecules under conditions of reabsorption by triplet-triple transitions

SOURCE: Optika i spektroskopiya, v. 20, no. 1, 1966, 53-57

TOPIC TAGS: absorption spectrum, emission spectrum, aromatic ketone, electron transition, luminescence

ABSTRACT: The authors study the kinetics of attenuation in organic materials with metastable levels where the emission spectra are distorted by reabsorption. Polymethylmethacrylate was used as a solvent with concentration of organic additions of 10^{18} centers/cm^3. The organic impurities used were diketone, Michler ketone and other molecules of the aromatic series. Excitation light from 2 IFK-2000 tubes surrounded by reflectors was passed through a specimen 60 mm in length and 6 mm in diameter after passing through a UFS-4 glass filter. The excitation pulse duration

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L 15568-66
ACC NR: AP6004404

was of the order of 10^{-3} sec, and maximum electrical energy was about 4000 joules. A lens system was used to focus the radiation from the end of the specimen onto the slit of a monochromator with a photomultiplier at the output. The photomultiplier signals were recorded by a low frequency oscillograph. The authors discuss the processes which take place when particles are excited by reabsorption to higher triplet states. Equations are derived for the intensity of radiation at a given frequency on the end of a cylindrical rod of given length assuming that reabsorption is due to triplet-triplet transitions. The theoretical results coincide satisfactorily with experimental data for diketone and Michler ketone molecules which have emission spectra consisting only of triplet-singlet bands completely covered by the broad triplet-triplet absorption spectra. Orig. art. has: 4 figures, 3 formulas.

SUB CODE: 20/ SUBM DATE: 20Oct64/ ORIG REF: 003/ OTH REF: 001

Card 2/2 mc

L 43757-66 EWP(e)/EWT(m) WH
ACC NR: AP6030711 SOURCE CODE: UR/0368/66/005/002/0153/0157

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E

AUTHOR: Naboykin, Yu. V.; Kramarenko, N. L.; Akopov, V. M.

ORG: none

TITLE: Investigation of multilayer dielectric coatings made from lead monoxide and cryolite

SOURCE: Zhurnal prikladnoy spektroskopii, v. 5, no. 2, 1966, 153-157

TOPIC TAGS: light filter, optic filter, ceramic film, metal film, dielectric layer, dielectric coating, laser R and D, optical resonator

ABSTRACT: Laser engineering requires coatings possessing high reflection coefficients, good stability, and resistance to high-density electromagnetic radiation. Traditionally, the dielectric mirrors used in lasers have been made from zinc sulfide and cryolite. The present article deals with an investigation of multilayer dielectric mirrors made from lead monoxide and cryolite with a view to determining whether such mirrors, which are easier to produce than the zinc sulfide type, can be successfully employed in lasers. Specially purified lead monoxide was used in producing layers with minimum absorption. The optical characteristics (reflection, transmission, and absorption—R, T, and A, respectively) of the mirrors were then measured by an instal-

Card 1/3 UDC: 535.345.6:666.246

Table 1. Optical characteristics of interference light filters

Type of filter	λ, Å	T_λ, %	Halfwidth of light filter $\delta\lambda$, Å
Glass-HLHLH-2-2L-HLHLH-air	5300	75,0	30
Glass-H'LH'LH'LH'-2L-H'LH'LH'LH'-glass	5200	75,0	40

Explanation: 1) H - PbO layer, H' - ZnS layer, L - cryolite layer;
2) the thickness of all layers is equal to $\lambda/4$.

lation consisting of a monochromator, an optical device, and a photomultiplier with a galvanometer. A nine-layer mirror with maximum reflection at 5780 Å had the following parameters: R = 97.0%, T = 1.0%, and A = 2.0%. Interference filters prepared from lead monoxide and cryolite were fully as good as optical filters made from zinc sulfide and cryolite. The optical characteristics of an eleven-layer optical filter made from lead monoxide and cryolite and a fifteen-layer filter made from zinc sulfide and cryolite are compared in Table 1. For

L 43757-66
ACC NR: AP6030711

similar filter parameters the lead monoxide-cryolite filter requires fewer layers than the zinc sulfide-cryolite filter. The layers improve their characteristics with time. Thus, the optical characteristics of an eleven-layer light filter two weeks after being removed from vacuum had improved as follows: transmission increased to the maximum, absorption decreased, and reflection remained constant. Orig. art. has: 3 figures and 1 table. [JA]

SUB CODE: 20/ SUBM DATE: 28Feb65/ ORIG REF: 004/ OTH REF: 002
ATD PRESS: 5075

Card 3/3 blg

L 45171-66 EWT(1)/EWP(e)/EWT(m)/EEC(k)-2/T/EWP(k) IJP(c) WG/WH
ACC NR: AP6027896 SOURCE CODE: UR/0368/66/005/001/0031/0035

AUTHOR: Berzing, E. G.; Naboykin, Yu. V. 49 B

ORG: none

TITLE: The effect of the parameters of the absorbing medium on the Q-switching of a laser resonator 25

SOURCE: Zhurnal prikladnoy spektroskopii, v. 5, no. 1, 1966, 31-35

TOPIC TAGS: ruby laser, cadmium selenide, organic dye, polymer film, glass, Q switch

ABSTRACT: Q-switching of a ruby 15 laser was invesitgated experimentally to verify certain concepts advanced theoretically elsewhere (A. M. Ratner, Sb. "Kvantovaya elektronika." Kiev, 1966, p. 166). The Q-switching materials used experimentally included cadmium selenide glasses, certain organic dye solutions, and dyed polymer films. A 6-j laser with a 12-cm ruby rod was used. The cavity consisted of external multilayer plane mirrors coated with lead oxide and cryolite. The absorbing medium was introduced into the cavity between one of the mirrors and the ruby. A reduction in the duration of laser spikes and a sharp decrease in their repetition frequency was observed in all three types of materials studied. However, reliable results with a high reproducibility were obtained only for liquids and glasses. The Cd-Se glasses functioned as Q-switches in the -40 < t < 50C temperature range and the generation consisted of individual, infrequent or single pulses with increased (10-fold) amplitude.

Card 1/2 UDC: 535.89

L 45171-66
ACC NR: AP6027896

depending on the thickness of the switching material. It was concluded that by varying the optic parameters of the absorbing media it is possible to control their capacity as a laser Q-switch. Many absorbing media are expected to acquire this capacity when cooled to low temperatures. It is probable that these materials have a long-lived metastable level. Orig. art. has: 3 figures. [26]

SUB CODE: 20/ SUBM DATE: 26Jun65/ ORIG REF: 006/ OTH REF: 005/ ATD PRESS: 5081

Card 2/2

L 46018-66 EWT(1)/EEC(k)-2/T/EWP(k) IJP(c) WG/JD

ACC NR: AT6015137 SOURCE CODE: UR/0000/66/000/000/0144/0149

AUTHOR: Kramarenko, N. L.; Meshcheryakov, A. V.; Naboykin, Yu. V.; Ratner, A. M.; Rom-Krichevskaya, I. A.

ORG: Physico-Technical Institute of Low Temperatures, AN UkrSSR (Fiziko-tekhnicheskiy institut nizkikh temperatur AN UkrSSR)

TITLE: Investigation of losses and loss-associated characteristics of laser radiation

SOURCE: Respublikanskiy seminar po kvantovoy elektronike. Kvantovaya elektronika (Quantum electronics): trudy seminara. Kiev, Naukova dumka, 1966, 144-149

TOPIC TAGS: solid state laser, laser R and D, LASER RADIATION

ABSTRACT: A method for experimental determination of the radiation loss in a solid-state-laser resonator is suggested. A 4-level system is considered. The loss is determined, a plot of output energy vs. mirror transmissivity is constructed, and estimated and experimental results are compared for a Nd-glass

Card 1/2

L 46018-66
ACC NR: AT6015137

specimen. All quantities that enter a total-radiation loss formula, except for dispersion loss, are directly measureable. Thus, the problem is reduced to determining the dispersion loss. The latter is derived from the experimental data on the effect of the first-mirror transmissivity upon the threshold pumping energy. The knowledge of the resonator radiation loss permits determining the optical transmissivity of mirrors. Orig. art. has: 4 figures and 16 formulas.

SUB CODE: 20 / SUBM DATE: 12Feb66 / ORIG REF: 004 / OTH REF: 002

Card 2/2 fv

L 46018-66 EWT(1)/EEC(k)-2/T/EWP(k) IJP(c) WG/GD

ACC NR: AT6015137 SOURCE CODE: UR/0000/66/000/000/0144/0149

AUTHOR: Kramarenko, N. L.; Meshcheryakov, A. V.; Naboykin, Yu. V.; Ratner, A. M.; Rom-Krichevskaya, I. A.

ORG: Physico-Technical Institute of Low Temperatures, AN UkrSSR (Fiziko-tekhnicheskiy institut nizkikh temperatur AN UkrSSR)

TITLE: Investigation of losses and loss-associated characteristics of laser radiation

SOURCE: Respublikanskiy seminar po kvantovoy elektronike. Kvantovaya elektronika (Quantum electronics); trudy seminara. Kiev, Naukova dumka, 1966, 144-149

TOPIC TAGS: solid state laser, laser R and D, LASER RADIATION

ABSTRACT: A method for experimental determination of the radiation loss in a solid-state-laser resonator is suggested. A 4-level system is considered. The loss is determined, a plot of output energy vs. mirror transmissivity is constructed, and estimated and experimental results are compared for a Nd-glass

Card 1/2

L 46018-66
ACC NR: AT6015137

specimen. All quantities that enter a total-radiation loss formula, except for dispersion loss, are directly measureable. Thus, the problem is reduced to determining the dispersion loss. The latter is derived from the experimental data on the effect of the first-mirror transmissivity upon the threshold pumping energy. The knowledge of the resonator radiation loss permits determining the optical transmissivity of mirrors. Orig. art. has: 4 figures and 16 formulas.

SUB CODE: 20 / SUBM DATE: 12Feb66 / ORIG REF: 004 / OTH REF: 002

Card 2/2 fv

L 46015-66 EWT(1)/EEC(k)-2/T/EWT(k) IJP(c) WW/JD
ACC NR: AT6015140 SOURCE CODE: UR/0000/66/000/000/0183/0187

AUTHOR: Naboykin, Yu. V.; Ogurtsova, L. A.; Fil', I. D.

ORG: Physico-Technical Institute of Low Temperatures, AN UkrSSR (Fiziko-tekhnicheskiy institut nizkikh temperatur AN UkrSSR)

TITLE: Re-absorption of excited-level radiation and a possibility of generation of light

SOURCE: Respublikanskiy seminar po kvantovoy elektronike. Kvantovaya elektronika (Quantum electronics); trudy seminara. Kiev, Naukova dumka, 1966, 183-187

TOPIC TAGS: laser, laser R and D, laser theory, RARE EARTH ELEMENT

ABSTRACT: The re-absorption phenomena in organic and organic-rare-earth compounds are briefly analyzed; under certain conditions, such substances have (quasi-) line spectrum structure and, hence, in principle they are usable for laser generation. The generation with organic molecules is possible if permitted transitions are used and even if the re-absorption is present. The possibility of re-absorption by the excited states of impurities should always be kept in mind when

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studying the use of new materials for laser purposes; this is particularly true with respect to organic materials where triplet-triplet absorption occurs frequently. Interpretation of kinetic curves, obtained as a result of studying the luminescence decay in powerful-light-excited systems, may be quite misleading if re-absorption phenomena are present. Several examples taken from published sources are cited. Orig. art. has: 2 figures and 6 formulas.

SUB CODE: 20 / SUBM DATE: 12Feb66 / ORIG REF: 008 / OTH REF: 012

L 00825-67 EWT(l)/EWP(e)/EWT(m) IJP(c) GG/WH/WW/GD

ACC NR: AT6015146 SOURCE CODE: UR/0000/66/000/000/0320/0321

53

AUTHOR: Kaplun, V. A.; Naboykin, Yu. V.; Pereverzev, Yu. A.; Pechiy, K. T.

B41

ORG: none

TITLE: Absorption of light by excited uranium glass

SOURCE: Respublikanskiy seminar po kvantovoy elektronike. Kvantovaya elektronika (Quantum electronics); trudy seminara. Kiev, Naukova dumka, 1966, 320-321

TOPIC TAGS: light absorption, uranium glass, excited state

ABSTRACT: Wide absorption bands within the visible spectrum range were detected in some uranium-activated glasses by an impulse photometer which permitted photographing the spectra at various stages of relaxation. The absorption had a relaxation time about 1 msec and was, apparently, due to the population of the same level which produced luminescence. Spectral curves of normal absorption, excited absorption, and emission (4000--6500 Å) are shown. The last two curves partially overlap. Addition of titanium oxide or lead oxide to the glass stopped the excited-state absorption. Orig. art. has: 1 figure.

SUB CODE: 20 / SUB DATE: 12Feb66 / ORIG REF: 001 / OTH REF: 002

Card 1/1 fv

L 04565-67 EWT(1)/EWT(m)/EWP(t)/EEC(k)-2/T/EWP(t)/ETI/EWP(k)
ACC NR: AP6032449 GG/WH SOURCE CODE: UR/0368/66/005/003/0387/0388

AUTHOR: Berzing, E. G.; Kramarenko, N. L.; Naboykin, Yu. V.

ORG: none

TITLE: Multilayer dielectric mirrors for lasers, based on lead oxide and cryolite

SOURCE: Zhurnal prikladnoy spektroskopii, v. 5, no. 3, 1966, 387-388

TOPIC TAGS: laser optics, resonator mirror, dielectric mirror, lead oxide, cryolite, dielectric material

ABSTRACT: This is a continuation of earlier work (PTE, no. 2, 189, 1965), where it is indicated that dielectric mirrors made with lead oxide as a base offer certain advantages over the customarily used mirrors with ZnS, because the vacuum need not be so high and the lead oxide evaporates at a lower temperature. The authors report that they produced a large number of mirrors based on lead oxide and cryolite for different spectral regions and with different numbers of layers, and found their reflection coefficients to be higher than those with ZnS. Prolonged tests with ruby and neodymium-glass lasers have shown such mirrors to be suitable in lasers with low output energy (on the order of 10 J). The strength of 13-layer mirrors was tested by a procedure similar to that described by A. M. Bonch-Bruyevich et al. (ZhPS v. 1, 265, 1964). The tests show that the glass substrate can withstand an energy density up to 300 J/cm^2, and that the strength is strongly influenced by the cleanliness of the glass prior to deposition of the dielectric layers. It is concluded that once a suitable coating technology is developed, the lead-oxide mirrors will prove to be just as strong as

Card 1/2 UDC: 535.31

L 04565-67

ACC NR: AP6032449

those using ZnS, and the ease of their manufacture and higher reflection coefficient will then make their use in lasers preferable. Orig. art. has: 1 table.

SUB CODE: 20/ SUBM DATE: 05Jul65/ ORIG REF: 003/ OTH REF: 002 / ATD PRESS: 5100

Card 2/2 vmb

ACC NR: AP6036818 SOURCE CODE: UR/0368/66/005/005/0692/0693

AUTHOR: Berzing, E. G.; Naboykin, Yu. V.

ORG: none

TITLE: Liquid metal reflectors for lasers

SOURCE: Zhurnal prikladnoy spektroskopii, v. 5, no. 5, 1966, 692-693

TOPIC TAGS: laser, laser optic material, ruby laser

ABSTRACT: An investigation is made of the possibility of using liquid metal mirrors as laser reflectors. Mercury mirrors, which are self-restorable after damage, are the most suitable from the standpoint of production and exploitation. Such mirrors can be of the open-surface type or can be housed in a special vessel. Both types were investigated and provided positive results. Fig. 1. is an optical diagram of a laser resonator using an open-surface type mercury mirror as one of the reflectors. In the experiments, the second reflector was usually a mirror with a multilayer dielectric coating based on lead oxide and cryolite, although another open-surface mercury mirror can be used. The use of one open-surface mercury mirror in the resonator resulted in an increase of the threshold value of pumping energy by 1.1 times No decrease in yield energy was observed. When two such mirrors were

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ACC NR: AP6036818

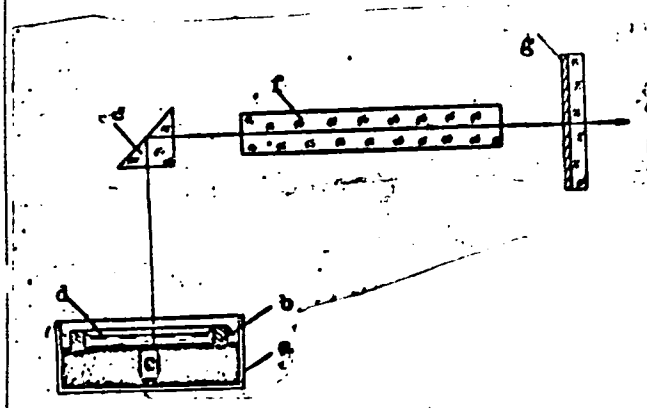


Fig. 1. Optical diagram of a resonator with a mercury reflector

a - Vessel; b - metallic ring; c - mercury; d - water; e - prism of total internal reflection; f - ruby; 9 - multilayer dielectric mirror.

used, giant pulses were obtained and the threshold value of pumping energy increased slightly. The duration and form of the pulses did not differ from those which were obtained when a multilayer mirror was used as the second reflector. Thus, in spite of their small coefficient of reflection and high absorption, liquid mercury mirrors can be used as laser reflectors. Alkali metals whose coefficient of reflection

Card 2/3

ACC NR: AP6036818

in the optical range is ~100%, can also be used. Liquid metal reflectors are especially suitable for obtaining mega- and gigawatt pulses. Such reflectors will be valuable for laboratory studies of the effect of laser radiation on exposed surfaces. Orig. art. has: 2 figures.

SUB CODE: 20/ SUBM DATE: 26Jul65/ ORIG REF: 001/ ATD PRESS: 5107

Card 3/3

NABOYSHCHIKOV, G.

Make use of these practices. Sel'. stroi. no.7:29 '62.
(MIRA 15:8)

1. Nachal'nik normativno-issledovatel'skoy stantsii Altaytselinstroya.
(Brickmaking—Technological innovations)

PHASE I BOOK EXPLOITATION SOV/4769

Ostroushko, Yu. I., P. I. Buchikhin, V. V. Alekseyeva, T. F. Naboyshchikova, G. A. Kovda, S. A. Shelkova, R. N. Alekseyeva, and M. A. Makovetskaya

Litiy, yego khimiya i tekhnologiya (Lithium, its Chemistry, and Technology) Moscow, Atomizdat, 1960. 198 p. Errata slip inserted. 5,000 copies printed.

Ed.: Ye. I. Panasenkova; Tech. Ed.: Ye. I. Mazel'.

PURPOSE: This book is intended for scientific workers, metallurgical engineers, and chemists working in the chemistry and technology of rare and sparsely distributed elements. Engineers and mechanics in charge of lithium production, and students in schools of higher education and in tekhnikums may find the book useful.

COVERAGE: The book deals with the geochemistry and mineralogy of lithium, the chemistry of lithium and its compounds, analytical chemistry of lithium, dressing of lithium ores, methods of processing lithium ores, and the metal-

Card 1/7

lurgy of lithium. It is based on Soviet and other technical literature published from 1918 through 1958. No personalities are mentioned. References accompany each chapter.

TABLE OF CONTENTS:

PODRZUCKI, Czeslaw, dr. inz.; NABOZNY, Marian, mgr. inz.;
STRAMA, Stanislaw, inz.

Experiments in carburizing cast-iron outside the cupo a-
furnace. Huta Lenina prace no.10:47-66 '61.

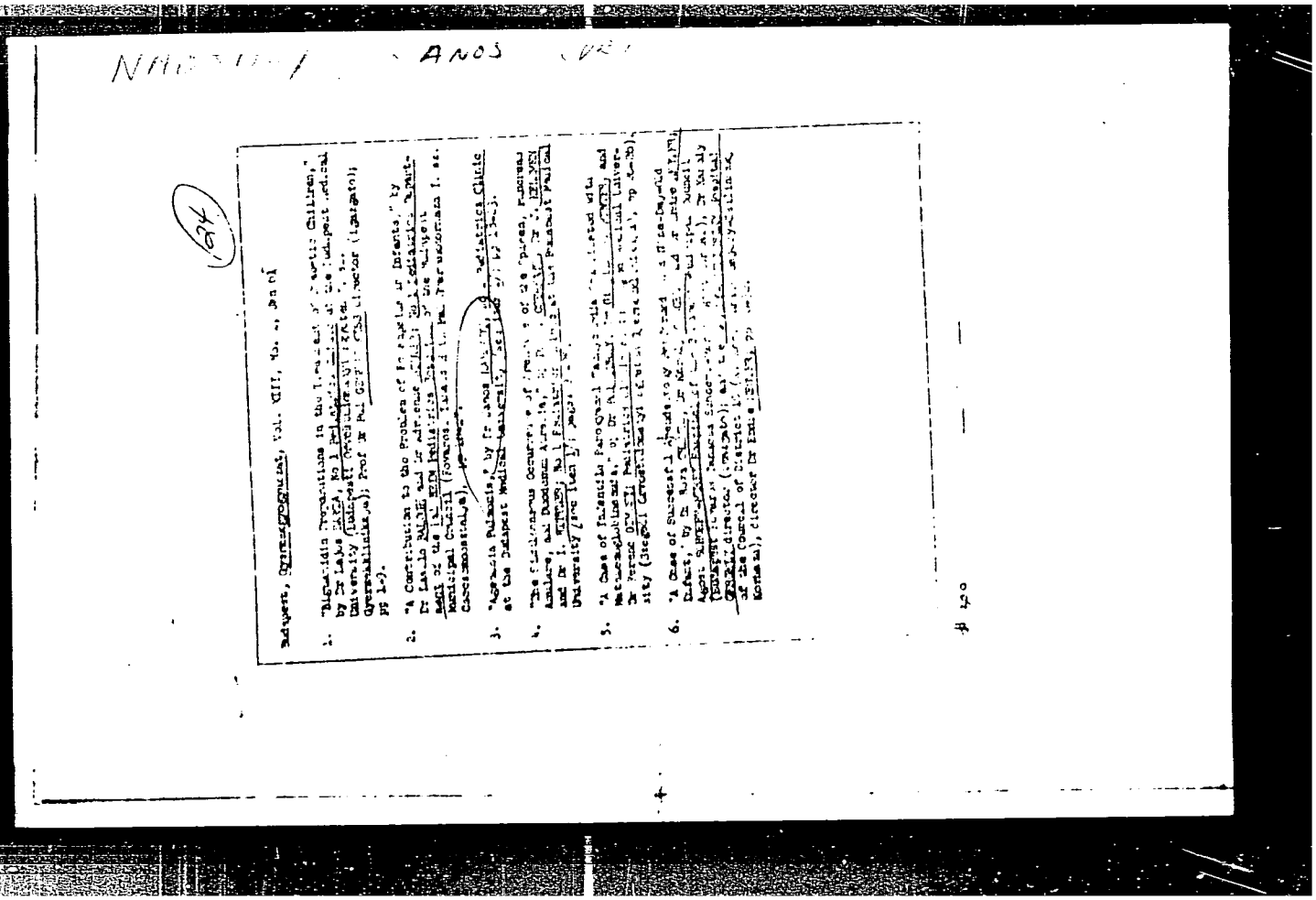
NABRACZKY, Bela, dr.

From the Knights' Castle of Malbork to Hitler's Masurian general headquarters. Elet tud 16 no.13:387-391 26 Mr '61.

BARTA, Lajos, dr.; DZERE, Margit, dr.; HABRADY, Janos, dr.

Effect of norandrosterolone phenylpropionate (durabolin) in growth retardation in children. Gyermekgyogyaszat 11 no. 9: 262-268 s '60.

1. Budapesti Orvostudomanyi Egyetem I. sz. Gyermekklinikajanak kozlemenye (Igazgato: Dr. Gegesi Kiss Pal egyetemi tanar, akademikus)
(TESTOSTERONE rel cpds)
(GROWTH)



NABRADY, Janos, dr.

Ellis-Van Creveld syndrome and neuroectodermal lesions. Orv.hetil. 102 no.5:216-220 29 Ja'61.

1. Budapesti Orvostudomanyi Egyetem, I. sz. Gyermekklinika.
(DYSCHONDROPLASIA case reports)

NABRADY, Janos, dr.

Pulmonary agenesis. Gyermekgyogyaszat 13 no.1:18-23 Ja '62.

1. A Budapesti Orvostudomanyi Egyetem I. sz. Gyermekklinikajanak (Igazgato: dr. Gegsi Kiss Pal akademikus, egyetemi tanar) kozlemenye.
(LUNGS abnorm)

STEINER, Bela, dr.; [illegible], Janos, dr.

Immunoallergy. [illegible] treated with [illegible]. (Preliminary report). [illegible] 5 I '64.

1. Orvostovabbkepzo [illegible], I. Gyermekgyogyaszati Tanszek.

HUNGARY

KORANYI, Gyorgy, Dr, NABRADY, Janos, Dr, VETRO, Eszter, Dr; Institute of Postgraduate Medical Education, II. Department of Pediatrics (chairman: STEINER, Bela, Dr) and Department of Radiology (chairman: DEAK, Pal, Dr) (Orvostovabbkepzo Intezet, II. Gyermekgyogyaszati Tanszek es Rontgenologiai Tanszek), Budapest.

"Myositis Ossificans Progressiva (MOP)."

Budapest, Orvosi Hetilap, Vol 107, No 32, 7 Aug 66, pages 1514-1517.

Abstract: [Authors' Hungarian summary] The case of a 12 year old boy is described whose disease was diagnosed as MOP on the basis of the clinical, histological and radiological findings. The MOP was accompanied by true exostosis multiplex cartilaginea. In connection with this rare disease, the literature aspects of MOP, its incidence, pathological characteristics and the problems of treatment are discussed. 5 Hungarian, 16 Western references.

NABRODOV, D.M.

Iron casting in metal forms. Lit.proizv. no.8:26-27 N '54.
(Iron founding) (MLRA 8:1)

NABRODOV, D. M.

USSR

10522* Machine for Pressure Casting Non-Ferrous Metal Parts. Stanok dlia lit'ia pod davleniem melkikh detalei iz tsvetnykh splavov. (Russian.) D. M. Nabrodov and L. M. Sobolev. *Liteinoe Proizvodstvo*, 1955, no. 5, May, p. 10-11. Design specifications and operational characteristics of press and heater. Diagrams.

NABRODOV, D., inzhener.

Five-ton hydraulic jack. Avt. transp. 34 no.7:20 Jl '56.
(MLRA 9:10)

(Lifting jacks)

137-1957-12-22806

Translation from: Referativnyy zhurnal, Metallurgiya, 1957, Nr 12, p 3 (USSR)

AUTHOR: Nabrodov, D. M.

TITLE: Toward High Quality Castings (Za vysokoye kachestvo otlivok)

PERIODICAL: Mashinostroitel', 1957, Nr 5, pp 42-43

ABSTRACT: A report of the Inter-Regional Conference on the reduction of spoilage in foundry production, held in Rostov-na-Donu (Rostov on Don) in 1956. A short summary of reports presented is given.

P. N.

1. Metallurgy conference USSR 2. Salvage-Reduction

Card 1/1

NABRODOV, D. M.

"New Methods of Casting in Agricultural Machine-Building."

All-Union Conference on Problems of Designing and Products Agricultural Machines (Vsesoyuznaya konferentsiya po voprosam konferentsiya po konstruirovaniya i proizvostva sel'skokhozyaystvennykh mashin. Rostov on Don, January 1958.

Mashinostroitel', Nr 3, p 46, (USSR)

NABRODOV, D. M. Cand Tech Sci -- (diss) "Continuous ~~velocity~~ heat-foundry process of obtaining wrought-iron ~~with utilization~~ of the physical heat of casts." Khar'kov, 1959. 12 p; 3 sheets of [redacted] graphs (Min of Higher and Specialized Secondary Education UkSSR. Khar'kov Polytechnic Inst im V. I. Lenin), 120 copies (KL, 49-59, 140)

S/128/60/000/001/004/007
A133/A127

AUTHOR: Nabrodov, D. M.

TITLE: Continuous process of producing malleable cast iron with simultaneous utilization of the physical heat of castings (subject still under consideration)

PERIODICAL: Liteynoye proizvodstvo, no. 1, 1960, 38

TEXT: The author emphasizes that at the present time two independent technological processes are used to produce malleable cast iron castings: casting and the heat treatment process. As early as in 1932 S. A. Saltykov (Ref. 1:"Liteynoye delo" No 7, 1933) tried to utilize the heat of solidifying castings in the subsequent annealing process. His tests, however, proved that graphitization in malleable cast iron cooled from 1,100°C down to 900°C proceeds very slowly owing to the lack of graphitization centers. Similar experiments conducted by G. I. Pogodin-Alekseyev (Ref. 3: "Liteynoye delo", No. 1, 1940) showed that castings shaken out at 800°C and subsequently annealed at 1,050°C just yielded sufficient

Card 1/5

centers for the first stage of graphitization. As commonly known, the optimum temperatures for the formation of graphitization centers range between 300-420°C. Strong effects may be achieved by preliminary hardening of malleable iron. It was found by G. N. Troitskiy and I. S. Kvater (Ref. 4: Metallurg No. 2, 1937) that normalization effects positively the increase of graphitization centers and simultaneously reduces the time of formation of the graphitic structure by 1.5 times. Accelerated cooling of castings shaken out at 850-950°C by compressed air blasts down to temperatures adequate for charging the annealing furnace gained significance. This method is considered "softer" than annealing in water or oil, and there should be no flaws and no deterioration of the mechanical properties of the castings. Similar results have been obtained with malleable castings produced in chill molds. To investigate further possibilities for obtaining malleable castings in a single process, which in accordance with the set-up of present foundries should not be difficult, the author and A. S. Shunikova (Footnote Ref. 2) conducted experiments at the NIITM, in

Continuous process of producing...

close cooperation with workers of the malleable cast iron shop and the Central Laboratory of the Rostsel'mash Plant with specimens cast in chill molds and in sand molds exposed to accelerated and natural cooling. The standard specimens were 16 mm in diameter (in accordance with GOST 1215-41), cast from a metal which was obtained by the duplex process(cupola furnace combined with an electric acid furnace) and modified with 0.02% aluminum. The average chemical composition of the cast iron consisted of: 2.55-2.7% C;1.2 - 1.45% Si; 0.40-0.55% Mn; 0.18-0.23% S; 0.04 - 0.06% Cr. The castings were shaken out at 850-950°C, cleaned, risers removed and cooled with compressed air or natural stagnant air down to 400-600°C. At these temperatures, the specimens were placed in the furnace and subjected to 3 variant annealing processes with or without preliminary low-temperature soaking (curves 1,2,3 in the diagram). The shortest annealing cycle and optimum mechanical properties of the test specimens were obtained with low-temperature soaking at 400°C (variant 1, indicated by curve 1). On half of the specimens cast in sand molds under these conditions showed proper-

Continuous process of producing...

ties corresponding to those of the cast iron grade КЧ 35-10 (KCh 35-10), and the other half resembled mechanical properties of the КЧ 33-8 (KCh 33-8) cast iron grade. The specimens cast in chill molds showed inferior mechanical properties, corresponding to those of the cast iron grades KCh 33-8 and 30-6. Accelerated cooling by air blast did not essentially effect the duration of the annealing time and the structure and the properties of the metal. The casting of the specimens in chill molds did not speed up the graphitization process either. Based on the experiments and studies of the author, several variants of a combined technological process of casting and annealing malleable cast iron parts with simultaneous utilization of the physical heat of the castings have been elaborated during the period 1957 - 1959 in a series of research works, including an author's abstract on his dissertation, Khar'kov 1959. A sharp reduction of the annealing cycle has been achieved, i.e. down to 12 - 16 hrs. There is 1 figure, 9 Soviet-bloc and 2 non-Soviet-bloc references.

Continuous process of producing...

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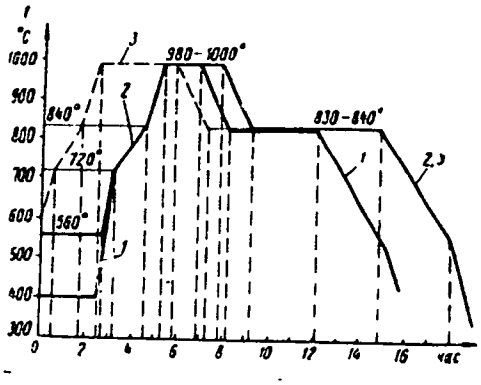
A133/A127

Diagram demonstrating 3 variant annealing processes with or without low-temperature soaking; variant 1 (curve 1) shows the optimum process.



Card 5/5

NABRODOV, D.M.

Dilatometry of malleable cast iron modified by the addition of aluminum with a high silicon content. Lit.proizv. no.11:22-23 N '61. (MIRA 14:10)
(Cast iron--Testing) (Dilatometry)

NABRZYSKI, Michal, mgr.farm., st. asyst.

Application of ionites in medicine. (To be contd.) Farmacja Pol 16 no.19:397-399 O '61.

1. Katedra Chemii Nieorganicznej, Akademia Medyczna, Gdansk. Kierownik katedry: doc. mgr. inz. St.Ostrowski.

NABRZYSKI, Michal, mgr.farm., st. asyst.

Application of ionites in medicine. Farmacja Pol 1[illegible] no.20: 418-420 O '[illegible]1.

1. Katedra Chemii Nieorganicznej, Akademia Medycyny, Gdansk Kierownik katedry: doc. mgr.inz. Ostrowski.

NABRZYSKI, Michal, mgr.

The role of pharmacy in the social health service. Farmacja Pol 18 no.14:333-336 25 Jl '62.

1. Wydzial Farmaceutyczny, Akademia Medyczna, Gdansk.

*

NABRZYSKI, Michal, mgr.

From the Danzig Branch of the Polish Pharmaceutical Society.
Farmacja Pol 20 no.1/2:59 25 Ja'64.

ACC NR: AP6032490 SOURCE CODE: UR/0413/66/000/017/0030/0030

INVENTOR: Kocherginskiy, M. D.; Kalachev, S. L.; Pen'kova, L. F.; Nabiullina, M. F.

ORG: none

TITLE: Air-depolarized zinc galvanic cell. Class 21, No. 185369 [announced by All-Union Scientific Research Institute of Current Sources (Vsesoyuznyy nauchno-issledovatel'skiy institut istochnikov toka)]

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 17, 1966, 30

TOPIC TAGS: galvanic cell, storage battery

ABSTRACT: An Author Certificate has been issued for an air-depolarized zinc galvanic cell which is assembled from series-connected disk elements and has an alkaline thickened electrolyte placed in a plastic container with a hermetically sealed cover (see Fig. 1). To simplify construction and extend cell life, a projection on the cover overlaps

Card 1/2 UDC: 621.352.7

ACC NR: AP6032490

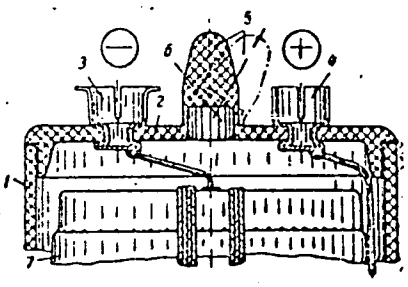


Fig. 1. Air-depolarized zinc galvanic cell

1 - Container; 2 - cover; 3 and 4 - terminals; 5 - projection; 6 - air vent; 7 - cell elements.

the air vent. This projection is removed when the cell is operating and is used as a plug when the cell is not in use. Orig. art. has: 1 figure.

SUB CODE: 10/ SUBM DATE: 13Sep65/

Card 2/2

NABURA, P.F., deputat Verkhovnogo Soveta SSSR

Efficient use of SKEM-3 combines. Mekh.sil'.hosp. 8 no.9: 4-6 S '59. (MIRA 13:1)

1. Kombayner kolkhoza im. Lenina Gaysinskogo rayona, Vinnitskoy oblasti.
(Combines (Agricultural machinery))

A 2

YUGOSLAVIA / Chemical Technology. Chemical Products and Their Application. Ceramics. Glass. Binding Materials. Concretes. H

Abs Jour: Ref Zhur-Khimiya, No 19, 1958, 65170

Author : Nabus Milivoj
Inst :
Title : Potentialities for the Production and Application of Containers of Pressed and Technological Glass

Orig Pub: Kemija u industriji, 1957, 6 No 4, N11-N13

Abstract: At present, the production of glass in Yugoslavia has increased four times above the level of 1939. Such an increase of production was caused by automatic production processes, and led to the accumulation of significant reserves of glass. As a result of the growth of the productivity of labor in the glass industry, and the introduction of

Card 1/2

YUGOSLAVIA / Chemical Technology. Chemical Products and H
Their Application. Ceramics. Glass. Binding
Materials. Concretes.

Abs Jour: Ref Zhur-Khimiya, No 19, 1958, 65170

Abstract: automatic and semiautomatic installations, the export of glass objects increased. However, the present condition of the glass industry is characterized by increased reserves of finished products. The way out of such a position consists in the expanded utilization of glass containers for the food-processing industry, in expanded export, in the standardization of products, and in the lowering of prices.

Card 2/2

NABUTOVSKAYA, E.B.

Entrance commutation devices for rural automatic telephone exchanges. Vest. sviazi 24 no.12:10-11 D '64 (MIRA 18:2)

1. Starshiy inzh. TSentral'nogo konstruktorskogo byuro Ministerstva svyazi SSSR.

NABUTOVSKIY, V.M.; SLUTSKIN, A.A.

Movement of quasi-particles with an arbitrary law of dispersion in weak nonuniform magnetic fields. Fiz. met. i metalloved. 12 no.2:170-175 Ag '61. (MIRA 14:9)

1. Institut teplofiziki Sibirskogo otdeleniya AN SSSR i Fiziko-tekhnicheskiy institut AN USSR.
(Particles (Nuclear physics))
(Dispersion)

LIFSHITS, I.M.; SLUTSKIN, A.A.; NABUTOVSKIY, V.M.

Characteristics of the motion of charged quasi-particles in a variable and inhomogeneous electromagnetic field. Zhur.eksp.i teor.fiz. 41 no.3:939-948 S '61. (MIRA 14:10)

1. Fiziko-tekhnicheskiy institut AN USSR.
(Dynamics of a particle)

21560

S/020/61/137/003/009/030
B104/B214

24,7700 (1144, 1160, 1469)

AUTHORS: Lifshits, I. M., Corresponding Member of the AS USSR, Slutskin, A. A., and Nabutovskiy, V. M.

TITLE: Scattering effect of charged quasi-particles at singular points in the p-space

PERIODICAL: Doklady Akademii nauk SSSR, v. 137, no. 3, 1961, 553-556

TEXT: The kinetic and resonance properties of metals and semiconductors are related to the dynamics of quasiparticles such as conduction carriers. This scattering effect of the quasi-particles is studied which is connected with the singularities of the dispersion law and not with the existence of a scattering center of force. In the presence of a magnetic field varying slowly in space and time or a weak longitudinal electric field the parameters ϵ (particle energy) and p_H (projection of the momentum in the direction of the magnetic field) are not constant. However, p_H and ϵ vary sufficiently slowly to allow the motion in the $\vec{p}$-space

Card 1/ 5

to be described as drift, rotation, and deformation of the "current petal". The motion of the particles in the $\vec{r}$-space can be represented as rapid oscillation about the "center of circle" $\vec{R}$ and smooth displacement of this center in the direction of the magnetic field. The following relation holds here: $\dot{\vec{R}} = \bar{v}_H \vec{\xi}$, where $\vec{\xi} = \vec{H}/H$, $\vec{H} = \vec{H}(\vec{R}, t)$. The mean velocity $\bar{v}_H$ is determined by the formula:

$v_H(P_H, \bar{\varepsilon}, \vec{\xi}) = -\frac{1}{2\pi m^*} \frac{\partial S}{\partial P_H}(P_H, \bar{\varepsilon}, \vec{\xi})$. Here, S is the area of cross section $\varepsilon = \bar{\varepsilon}$, $p_H = P_H$. The mean values $P_H = \bar{P}_H$, $\bar{\varepsilon}$, and the unit vector $\vec{\xi}$ of the magnetic field give the position of the "current petal" in the momentum space. The most important characteristic of the average motion in the above mentioned type of field is the adiabatic invariance of the quantity $S(P_H, \bar{\varepsilon}, \vec{\xi})/H(\vec{R}, T)$ which allows the mean differential equation to be partially integrated. For a complete knowledge of the motion it is necessary to know the equation for the quantities

P_H or $\bar{\varepsilon}$. In the following these equations are introduced for three forms of the field: 1) For a weak homogeneous constant magnetic field this equation reads: $\bar{\varepsilon}$ = const. 2) For the case of parallel electric and magnetic fields: $\dot{P}_H = eE$. 3) If an alternating field $\vec{H}(t)$ acts on the particle the resulting electric field has to be taken into account which leads to a nonconservation of $\bar{\varepsilon}$. In that case: $\dot{P}_H = \frac{1}{m^*} \frac{\partial}{\partial \epsilon} \iint \vec{P}_\perp dS$, where $\vec{P}_\perp$ is the projection of the momentum on a plane perpendicular to $\vec{\xi}$. With the help of these equations the drift of the "current petal" is studied by the saddle point of the isoenergetic surface (Fig. 1). From a short consideration it is shown that the introduction of a particle in the region I and II may be considered as a random process. It is therefore, possible to speak of a scattering in the neighborhood of the saddle point which is a singular point in the sense of the dynamics of the motion of a particle in a homogeneous magnetic field. The scattering probabilities w_1 and w_2 in the regions I and II possess fully defined

values which are determined in the following. For the case (1) mentioned above the ratio of the probabilities is given by $w_1/w_2 = \frac{\partial}{\partial l}(S_1/H)\Big/\frac{\partial}{\partial l}(S_2/H)$. Here, l is the length along the lines of force of the magnetic field, $S_{1,2}(\varepsilon, b_H(\vec{\xi}), \vec{\xi})$ is the area of cross section of each curve at the intersection of ε = const with the surface passing through the singular points and perpendicular to $\vec{\xi}$ (1). For the case (2): $w_1/w_2 = \frac{d}{dp_H} S_1(p_H, \varepsilon_{cr}(p_H))/\frac{d}{dp_H} S_2(p_H, \varepsilon_{cr}(p_H))$, where $\varepsilon_{cr}(p_H)$ is defined on the isoenergetic surface $\varepsilon = \varepsilon_{cr}(p_H)$ which contains the singular point for a given p_H. It is found further that the time of drift through the singular point is about $T\ln\alpha$. Therefore, for the realization of this effect it is necessary that the inequality $\tau \gg T\ln\alpha$ be satisfied. It is so for $H \sim 10^4$ oersteds and a path length $\gtrsim 0.1$ cm without requiring any practical limitation on the value of α.

Card 4/5

In the classical considerations made here the tunnel effect is not taken into account. There are 1 figure and 1 Soviet-bloc reference.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk USSR (Institute of Physics and Technology, Academy of Sciences UkrSSR).
Institut teplofiziki Sibirskogo otdeleniya Akademii nauk SSSR (Institute of Heat Physics of the Siberian Department of the Academy of Sciences USSR)

SUBMITTED: January 2, 1961

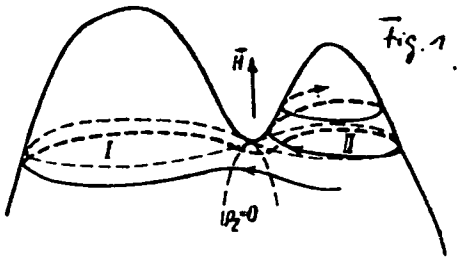


Fig. 1

S/181/62/004/003/019/045
B125/B108

24.7900

AUTHORS: Kaner, E. A., and Nabutovskiy, V. M.

TITLE: Effect of a slightly inhomogeneous magnetic field on resonance phenomena in metals

PERIODICAL: Fizika tverdogo tela, v. 4, no. 3, 1962, 685-691

TEXT: Peculiarities of magnetoacoustic and cyclotron resonances in metals placed in a slightly inhomogeneous field were studied theoretically neglecting the insignificant transverse drift. By solving the kinetic equation

$$\left(\frac{d\chi}{dt}\right)_{\text{collis}} + \nu\chi = g, \tag{2}$$

(3)

$$\left(\frac{d}{dt}\right)_{\text{collis}} = i\omega + \mathbf{v}\nabla - \frac{e}{c}[\mathbf{vH}]\frac{\partial}{\partial \mathbf{p}}, \tag{4}$$

$$g = \Lambda_{ik}u_{ik}.$$

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Effect of a slightly inhomogeneous ...

by the method of characteristics, one obtains (like for a homogeneous field) the expression

$$\alpha(\mathbf{R}) = \frac{eH(\mathbf{R})}{h^3 W_0} \int_{\varepsilon=\mu} dp_H \sum_{t_\alpha} g_\alpha^* J_\alpha^* \times$$
$$\times \left\{ \frac{1}{2} g_\alpha J_\alpha + \sum_{-\infty < t_\beta < t_\alpha} g_\beta J_\beta \exp\left[(i\omega + \nu)(t_\beta - t_\alpha) + i\mathbf{k}(\mathbf{r}_\beta - \mathbf{r}_\alpha)\right] \right\}, \quad (9)$$

for the coefficient of absorption of ultrasound. Here, $\chi^{(1)}(\varepsilon - \mu)$ is the non-equilibrium additional term in the Fermi distribution function $f_0(\varepsilon - \mu)$; ε, $\vec{p}$, $\vec{v} = \partial\varepsilon/\partial\vec{p}$ are energy, quasimomentum, and velocity of the electron; ν is the collision frequency ($\omega \gg \nu$), $\Lambda_{ik}(\vec{p})$ are the components of the tensorial deformated potential, $u_{ik} = (\partial u_i/\partial x_k + \partial u_k/\partial x_i)/2$ is the deformation tensor. The functions with the indices α and β refer to the instants of time t_α and t_β. The position of the resonance is not changed by a slight inhomogeneity of the magnetic field ($b \neq 0$).

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$$\alpha = (\hbar^3 W)^{-1} \mathrm{Re} \int d^3\mathbf{p}\, \delta(\varepsilon - \mu)\, \bar{g}_0^* \int_{-\infty}^{t} dt' \bar{g}_0(t') \exp\{(i(\omega + \nu)(t' - t) - \\ - i\mathbf{k}[\mathbf{R}(t) - \mathbf{R}(t')], \qquad (25),$$

where $\vec{R}(t) = \vec{r}(t)$ is the trajectory averaged over the fast revolution. For large $|\vec{k}\ \vec{R}|$ and small $\nu\theta$ one can set $\alpha = \alpha_1 + \alpha_2$. I. M. Lifshits is thanked for his interest discussions. There are 3 figures and 8 references: 7 Soviet and 1 non-Soviet. The reference to English-language publication reads as follows: A. B. Pippard. Phil. Mag., 2, 1147, 1957.

ASSOCIATION: Institut radiofiziki i elektroniki AN USSR Khar'kov
(Institute of Radiophysics and Electronics AS UkrSSR Khar'kov)

SUBMITTED: November 4, 1961

ACCESSION NR: AP4043343 S/0181/64/006/008/2294/2296

AUTHOR: Nabutovskiy, V. M.

TITLE: Magnetic traps for electrons in metals

SOURCE: Fizika tverdogo tela, v. 6, no. 8, 1964, 2294-2296

TOPIC TAGS: magnetic trap, electron trapping, metallic crystal lattice, Fermi statistical theory, electron resonance

ABSTRACT: This is a continuation of an earlier paper by the author with A. A. Slutskin (FMM, v. 12, 170, 1961). It is shown that, in addition to the ordinary electron traps already described in the literature, an inhomogeneous magnetic field having a maximum on the force line can serve as a trap for electrons having a minimum section on the Fermi surface and moving in a metal. The frequency and the amplitudes of small oscillations of the center of a "Larmor turn" in x-space and in p-space are also calculated. The resonance

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ACCESSION NR: AP4043343

of such electrons at a frequency $\Omega \sim v_F/L$ is predicted (v_F -- electron velocity on the Fermi surface, L -- characteristic length over which the field varies). Estimates show that the dimension of the crystal region capable of contributing to the resonance is approximately 0.03 cm and that the field required is much larger than 10^3 Oe. "I thank corresponding member of AN SSSR I. M. Lifshits for interest in the work and V. L. Pokrovskiy for a discussion of the results." Orig. art. has: 2 figures and 2 formulas.

ASSOCIATION: Institut teplofiziki SO AN SSSR, Novosibirsk (Institute of Heat Physics, Siberian Department AN SSSR)

SUBMITTED: 03Feb64 ENCL: 00

SUB CODE: SS NR REF SOV: 004 OTHER: 001

Card 2/2

L 11413-66 EWT(1)/EWT(m)/T/EWP(t)/EWP(k)/EWP(b) IJP(c) JD
ACC NR: AP6000860 SOURCE CODE: UR/0181/65/007/012/3591/3599

AUTHOR: Nabutovskiy, V. M.

ORG: Institute of Thermophysics SO AN SSSR, Novosibirsk (Institut teplofiziki SO AN SSSR)

TITLE: On the influence of collisions between electrons and the walls of a sample on the absorption of ultrasound in a metal

SOURCE: Fizika tverdogo tela, v. 7, no. 12, 1965, 3591-3599

TOPIC TAGS: ultrasonic absorption, electron collision, magnetoacoustic effect, free path

ABSTRACT: The prupose of the investigation was to determine the monotonic part (with respect to the magnetic field) and the magnetoacoustic oscillations of the absorption coefficient of ultrasound for wave propagation perpendicular to the magnetic field, under the conditions that the sample dimensions d in the direction of the magnetic field are smaller than or of the same order as the mean free path. The problem is similar to that considered qualitatively for unbounded

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samples by A. B. Pippard (Phil. Mag. v. 2, 1147, 1957) and solved later by V. L. Gurevich (ZhETF v. 37, 71, 1959). To this end the author calculates the influence of the scattering of electrons on the walls of a metallic plate of thickness d on the magnetoacoustic phenomena when k is perpendicular to H (k -- wave vector of the ultrasound, H -- magnetic field intensity). The results of the calculation show that when the $d < \ell$ the monotonic part of the absorption coefficient of ultrasound increase sharply (by approximately ℓ/d times, where ℓ is the mean free path). The amplitude of the oscillating part changes much more slowly. The relative depth of the oscillations increases and tends to saturation. The results are generalized to include the case of arbitrary scattering surfaces. Author thanks V. L. Pokrovskiy and A. Z. Patashinskiy for useful discussions of the results and E. A. Kaner for useful remarks. Orig. art. has: 2 figures and 29 formulas.

SUB CODE: 20/ 11/ SUBM DATE:21Mar65/ ORIG REF: 009/ OTH REF: 001

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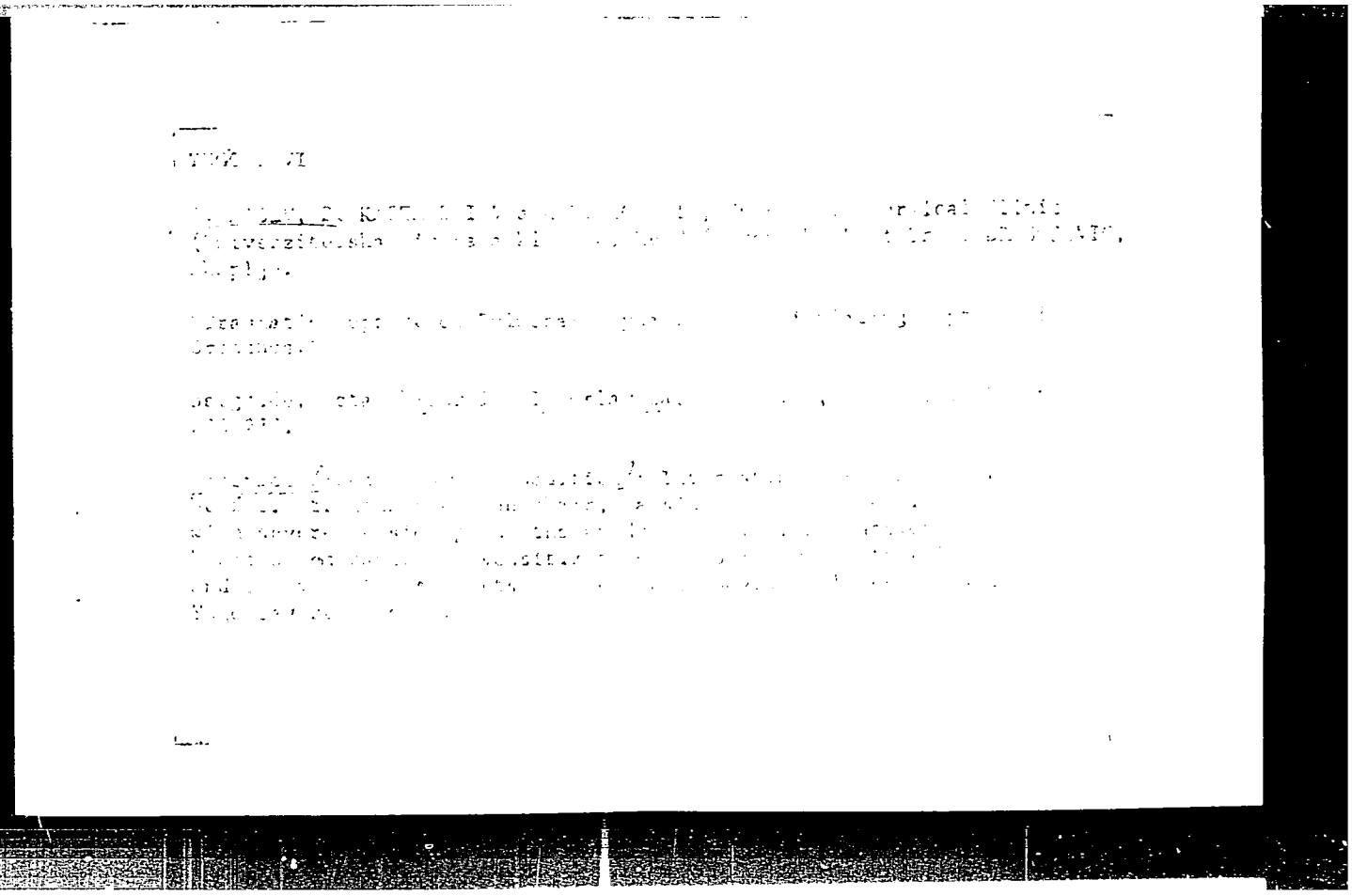
(BRONCHIAL DISEASES)



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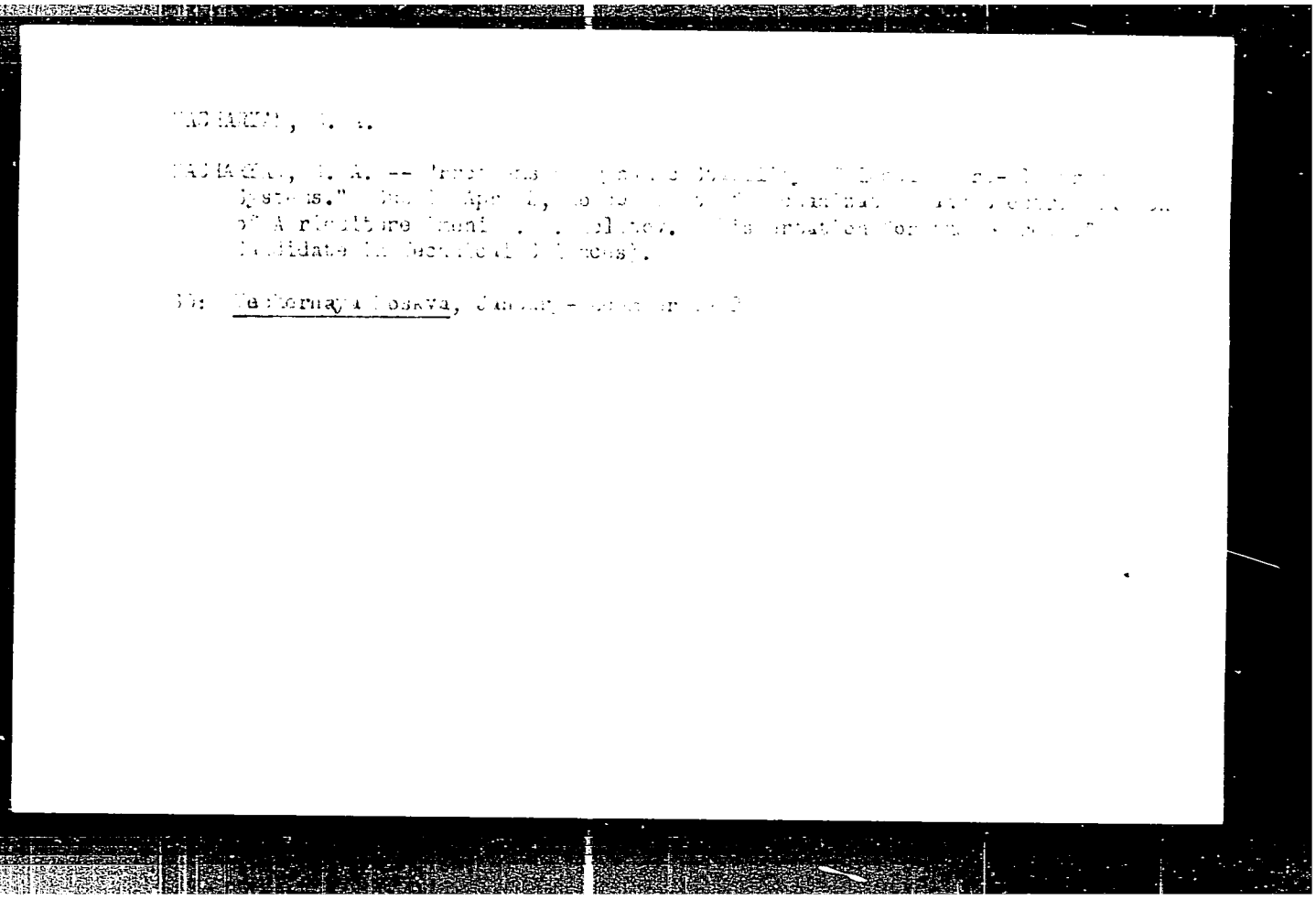

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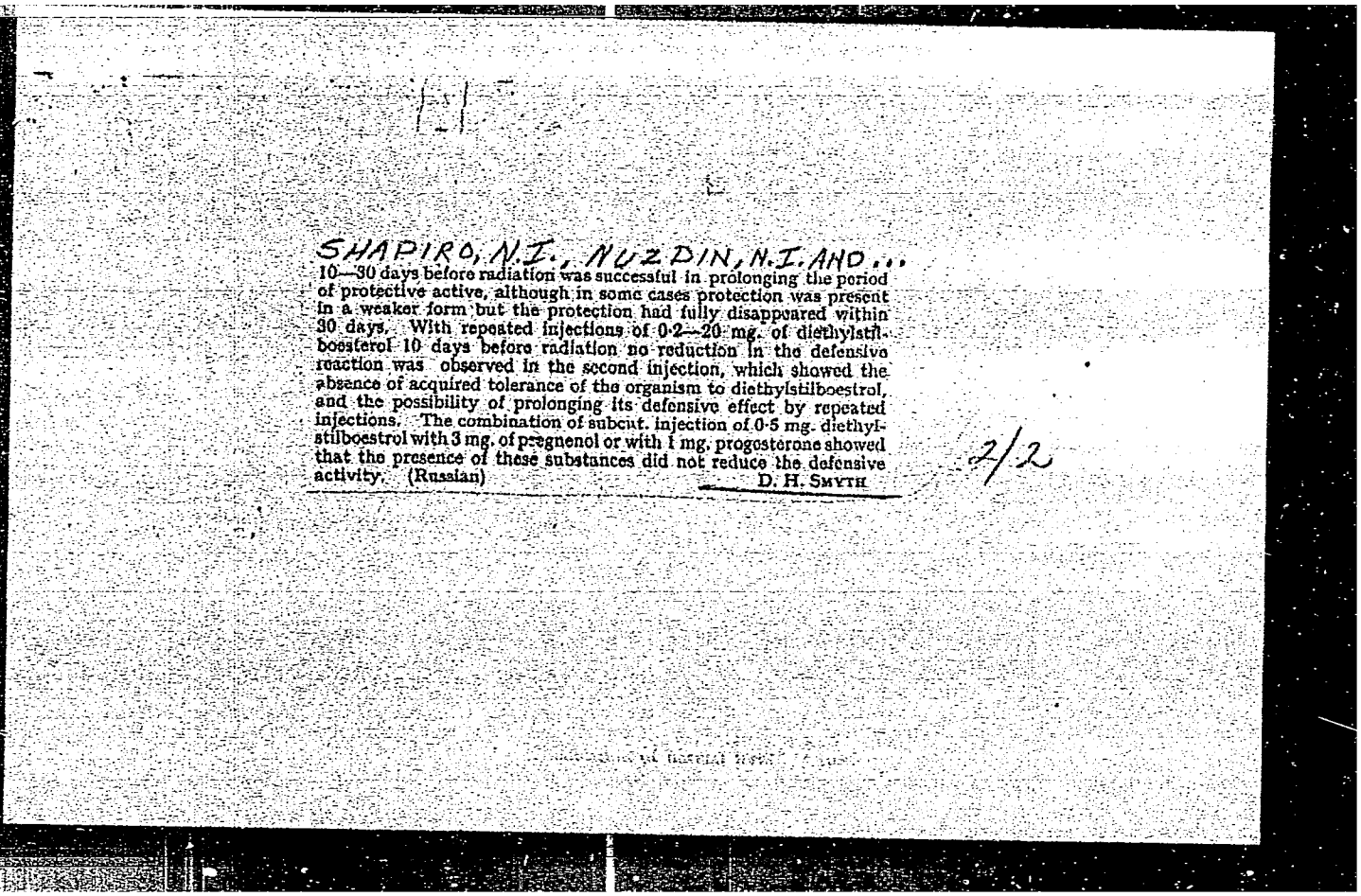
4972. Sterilising activity of ionising radiation in mammals. I. Effect of X-rays on fertility of male mice. N. I. Nuzdin, N. I. Shapiro, and O. N. Petrova. II. Effect of X-rays and of gamma radiation on the oestrous cycle in female mice. N. I. Nuzdin, N. I. Shapiro, O. N. Petrova, and O. N. Kitaeva. III. Nature of the sterility produced by the action of X-rays. N. I. Nuzdin, N. I. Shapiro, O. N. Petrova, and I. A. Nachaev *Radiobiology, Acad. Sci., U.S.S.R.*, 1955, 83—112, 113—149, 150—159; *Referat. Zh. Biol.*, 1956, Abstr. Nos. 51,460, 51,461, 51,462.—I. A single dose of Röntgen rays 200—400 R causes sterilisation, accompanied by various signs of radiation illness and a lowering of body weight. Fertility depends on the dose, and on the time of crossing the animals with unradiated females. The lowest fertility was seen on crossing one month after radiation, and was 16·7% compared with 84·8% in the controls. Fertility was almost normal in crossing either immediately or after 3 months of radiation. Investigation of the testes of the radiated animals showed a sharp disturbance of spermatogenesis due to damage to the germ cells in the early stages of spermatogenesis, and to a temporary interruption of spermatogenesis on account of loss of capacity of the cells for division. Within a month after radiation recovery of spermatogenesis started and continued for 3 months. The spermatozoid stage is the most sensitive, but the spermatozoids already formed do not undergo damage. Post embryonic development of the males of the first generation is not different from normal animals.

II. With a single dose 15—25 R, the oestrous cycle in mice of strain A was not disturbed but with doses of 50, 100, 200, and 400 R changes took place in the time relations of the cycle; the frequency of pro-oestrous and oestrous was lowered, and there was a lengthening of di-oestrous and met-oestrous. The disturbance of the normal cycle begins with the second months after radiation. The absence of change in the oestrous cycle in mice radiated with small doses 15—25 R is not an indication of normal fertility; the number of



SHAPIRO, N.I., NUZDIN, N.I. AND ...

10—30 days before radiation was successful in prolonging the period of protective active, although in some cases protection was present in a weaker form but the protection had fully disappeared within 30 days. With repeated injections of 0·2—20 mg. of diethylstilboesterol 10 days before radiation no reduction in the defensive reaction was observed in the second injection, which showed the absence of acquired tolerance of the organism to diethylstilboestrol, and the possibility of prolonging its defensive effect by repeated injections. The combination of subcut. injection of 0·5 mg. diethylstilboestrol with 3 mg. of pregnenol or with 1 mg. progesterone showed that the presence of these substances did not reduce the defensive activity. (Russian)

D. H. SMYTH

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